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Redescription of *Apomyelois cognata* (Staudinger, 1871) (Lepidoptera, Pyralidae, Phycitinae) with first record from the South Urals

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Abstract. Until recently, *Apomyelois cognata* (Staudinger, 1871) was known only from the type series collected 150 years ago in the Lower Volga region, as well as old records from Iran and Cyprus (the latter unconfirmed). In 2011 and 2020, more specimens of this little-known species were collected in the South Urals (Russia), presenting a new record for the area. The species identity was confirmed via examination of syntypes preserved in the Museum für Naturkunde, Berlin. A lectotype designation for the species is made and a detailed redescription with illustrations of male and female genitalia is given.

Introduction

Apomyelois Heinrich, 1956 was originally established as a monotypic genus based on the designation of *Dioryctria bistriatella* Hulst, 1887 as the type species. Today, it encompasses 11 species from the Holarctic and Palaeotropical regions (Nuss et al. 2003–2021). However, the current list of species assigned to the genus should be further revised. Only two related species, *A. bistriatella* and *A. cognata* (Staudinger, 1871), are present in Europe and the European part of Russia. The former has a widespread distribution in the temperate zone of the Holarctic, including North America and Eurasia. The second similar but little-known species, *A. cognata*, was originally described as part of the genus *Myelois* Hübner, 1825, based on four males and a single female found by A. Bekker and H. Christoph near Sarepta (now the Krasnoarmeysk district of the city of Volgograd). Later, records of *M. cognata* from the same locality were included in a monograph by Ragonot (1893), as well as the "Catalog der Lepidopteren des palaearctischen..." by Rebel (1901). Spuler (1910) noted *M. cognata* for the vicinity of Vienna, and Hayward (1938) reported from Cyprus: "*Myelois cognata*, Staudinger. – A single specimen from Platres in September... ". Soon after, Rebel (1939) questioned the occurrence of *M. cognata* in Cyprus. Later on, the records from Cyprus were also cited by Arenberger (1994). Recent reports from Russia (Anikin et al. 2017, Sinev et al. 2019) were confirmed using the aforementioned type series collected near Sarepta. Based on the genital structure of the *M. cognata* syntypes, Roesler (1988) clarified the taxonomic position and established a new generic combination as *Apomyelois cognata* (Staudinger, 1871), further suggesting that

Apomyelois schaeuffelella Amsel, 1959, described from Iran, be considered as a junior synonym of *A. cognata*. Despite the above reports, no additional material other than the syntypes has been obtained to date. Furthermore, only two males and a single female from the type series are preserved in the Museum für Naturkunde in Berlin (MfN), and the locality of the other two males listed in the original description by Staudinger (1871) is unknown. Unfortunately, it was not possible to locate the holotype of *A. schaeuffelella* from Iran in the collections of Das Staatliche Museum für Naturkunde Karlsruhe (SMNK).

During a lepidopterological survey of the southernmost part of the South Urals (Russia, Orenburg) in July 2011 and 2020, 17 specimens of Phycitinae were collected using light traps and identified as *A. cognata* by comparison with the type series preserved in the MfN. This constitutes the second record of this species from Russia in 150 years, with the South Urals being its easternmost locality. *A. cognata* is redescribed below on the basis of new material, and male and female genitalia of this species are described and illustrated for the first time.

Materials and methods

This study is based on type material from MfN, as well as 17 specimens of *A. cognata* and six specimens of *A. bistriatella* collected at night using artificial light sources. Chloroform was used as a killing agent. Genitalia were examined by soaking abdomens in boiled 20% KOH for four minutes, and finally mounting both genitalia and abdomens in glycerol. The pinned specimens were photographed with a Canon 750D camera with a Canon MP-E-65 mm lens. Genitalia preparations were photographed with a Canon EOS 1100D camera mounted on an Olympus BX41 stereomicroscope. Methods for identification of genitalia structure and external characteristics largely follow Falkovitsh and Stekolnikov (1978), with minor corrections by Kristensen (2003).

Collection information and abbreviations:

MfN Museum für Naturkunde, Leibniz- Institut für Evolutions- und Biodiversitätsforschung, Berlin, Germany;
NMPC National Museum, Natural History Museum, Prague, Czech Republic;
SMNK Das Staatliche Museum für Naturkunde Karlsruhe, Germany;
SSU Samara National Research University, Samara, Russia;
ZIN Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia.

Apomyelois cognata (Staudinger, 1871)

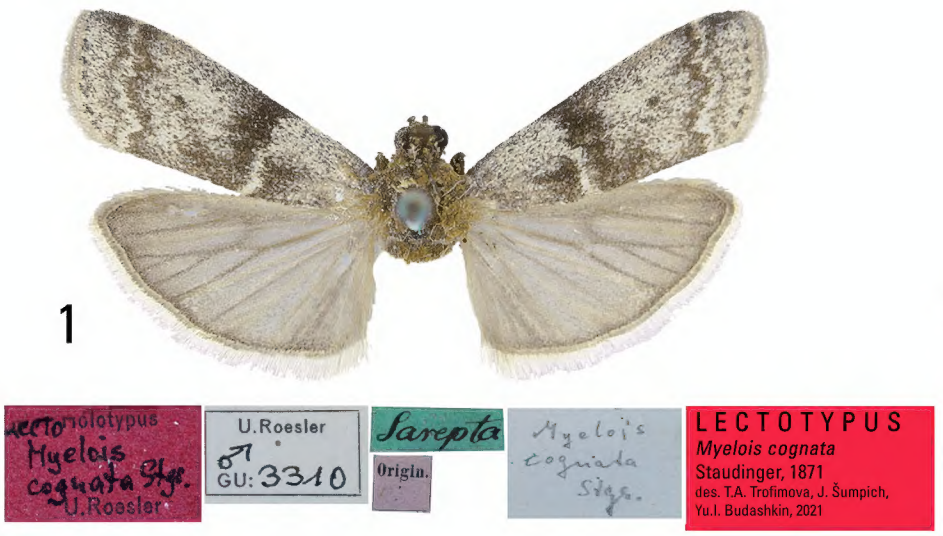
Figs 1–4, 6–10

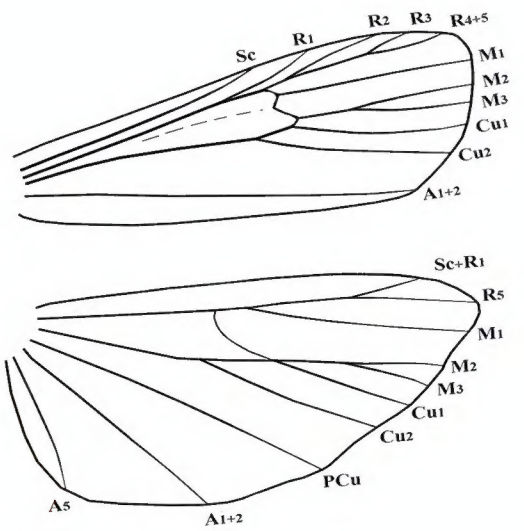
Myelois cognata Staudinger, 1871: 273–274.
Apomyelois schaeuffelella Amsel, 1959: 21, pl. 1 fig. 14, pl. 4 fig. 4. synonymised by Roesler 1988: 179.

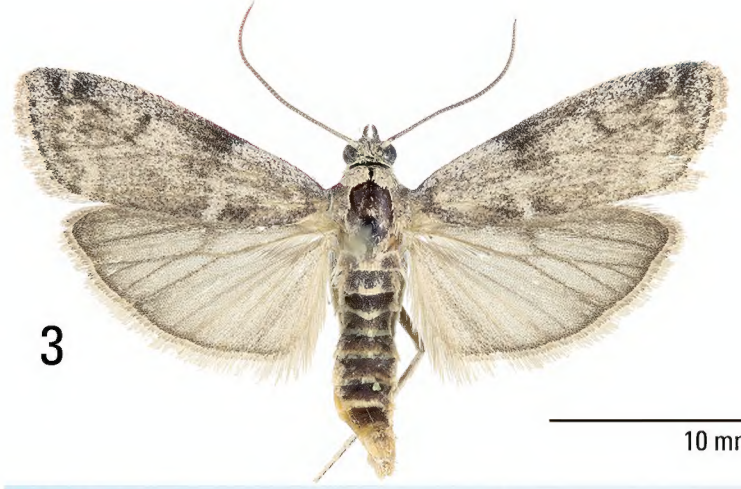
Material examined. Type material. Lectotype, ♂, here designated, labelled: "Origin."; "Sarepta"; "Myelois cognata Stgr"; "U. Roesler ♂ GU 3310"; "LectoHolotypus Myelois cognata Stgr. U. Roesler"; "Lectotypus Myelois cognata Staudinger, 1871, des. T.A. Trofimova, J. Šumpich, Yu.I. Budashkin, 2021" (MfN). Paralectotypes, 1 ♂, 1 ♀, here designated, labelled: "Origin"; "Sarepta"; "Myelois cognata Stgr."; "U. Roesler ♀ GU 3309"; "Allolectotypus Myelois cognata Stgr. U. Roesler"; "Paralectotypus Myelois cognata Staudinger, 1871, des. T.A. Trofimova, J. Šumpich, Yu.I. Budashkin,

2021" (MfN) and "Origin"; "Sarepta", "Myelois cognata Stgr."; "Paralectotypus Myelois cognata Staudinger, 1871, des. T.A. Trofimova, J. Šumpich, Yu.I. Budashkin, 2021" (MfN).

Other material. Russia: 4 ♂♂, 7 ♀♀, S Ural, Donskoe env., 260 m, Verbljushka hill., 51°23'11"N, 59°48'40"E, 22.–24. vii.2011, gen. prep. J. Šumpich 21077 (♂) and 211078 (♀), J. Šumpich leg. (NMPC); 5 ♀♀, Orenburg Region, Akbulak district, Vasilievka vill., psammophytic steppe, 50°54'N, 55°46'E, 7.vii.2020, D. Shovkoon leg. (SSU); 1 ♂ Russia, Orenburg Region, Belyaevka district, 3.5 km E of Novoorlovka vill., riv. Ural, 51°23'14.09"N, 56°36'47.88"E, 29.–30.vii.2020, S. A. Knyazev leg. (ZIN).







Figures 1–5. Voucher specimens and habitat of *Apomyelois cognata* (Staudinger, 1871). **1.** Lectotype, male, Volgograd [Sarepta]; **2.** Venation of wings; **3, 4.** Voucher specimens from South Ural, Russia, J. Šumpich leg.: **3.** Male; **4.** Female; **5.** Habitat in the floodplain forests bordering the Ural River.

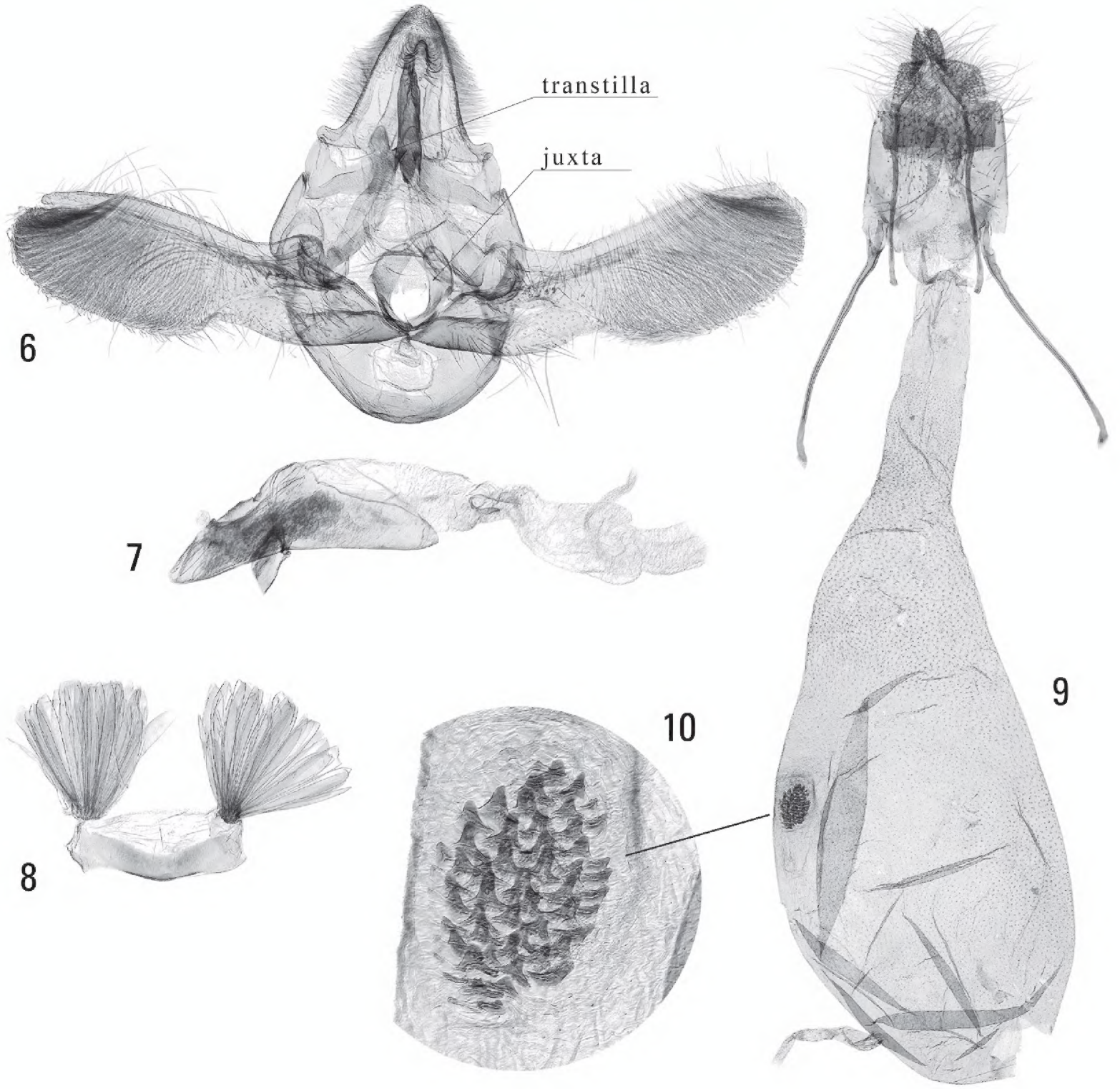
Diagnosis. *Apomyelois cognata* and *A. bistriatella* occur sympatrically in habitats across the South Urals, with *A. cognata* differing in predominantly larger adult size and broader, more contrasting forewings. The male genitalia of *A. cognata* resemble those of A. *bistriatella*, but differ in having a narrower gnathos and more pronounced bilobed median process of the transtilla; the vinculum in *A. cognata* is slightly shorter and rounder than the more elongate vinculum of *A. bistriatella*. The female genitalia are very similar to those of *A. bistriatella*, but apophyses and corpus bursae are about 1.7 times as long as those of *A. bistriatella*. The male and female genitalia of *A. bistriatella* were illustrated in Heinrich (1956: p. 43, figs 197, 676).

Redescription. External appearance. (Figs 1–4) Forewing length ♂: 10–11 mm, ♀: 11 mm. Head round, smooth, frons rounded, vertex covered with grey scales; labial palpus smooth, often upturned or protruding anteriorly: segment 1 white, with slender strip of grey scales in upper third; segment 2 long, upcurved, covered in greyish-brown scales with admixture of white scales on outer surface and white scales on inside surface; segment 3 short, straight, with same colour as segment 2; maxillary palps short, thin and white; proboscis well developed, white, covered with greyish scales at base; occiput with broad, greyish scales; scapus simple, covered with brown scales; flagellum filiform, brown, male flagellomeres shortly ciliate. Patagia grey, tegulae and thorax dark grey. Forewing ground colour grey; dark grey mixed with white in basal, costal, and external areas; costal and basal areas with scattered whitish scales on grey ground; dorsal half of basal area with densely scattered grey scales; ante-medial line whitish, oblique and angulated in cubital area, edged with dark grey and darkened from costa to Cu2 by a blackish diffused spot. Medial field grey with scattered whitish scales. Paired dots at base of M1 and M2 consist of groups of black scales or are united in a sickle-shaped streak. Whitish postmedial line distinctly angulated, serrated, bordered with dark grey scales. Marginal field pale grey, spotted with black distally; fringe grey with white-tipped scales. Hindwing light grey, marginal line dark grey, fringe pale grey. Forewing venation (Fig. 2): Sc about ½ wing length; R2 and R3 united at base; R4+5 from R3 at ⅓ length to costa before apex, M3 and M2 united at half length to termen; Cu1 and Cu2 separated; A1+2 united. Hindwing venation quadrifid: Sc+R1 and R5 stalked; R5 and M1 united at base; M2+M3 stalked at about ½ of length; Cu1 and Cu2 separated; PCu, A1+2 and A3 separated. Abdomen segments in male dark grey with whitish bands intersegmentally. Tergum VIII subrectangular, evenly sclerotized; sternum VIII as curved sclerotized band; culcita in the form of paired lateral tufts of large scales (Fig. 8).

Variation. Some specimens may be darker or more contrasting in appearance; paired dark dots on the medial field of the forewings may be united in a dark sickle-shaped streak. Labial palps may project slightly forward over the head.

***Male genitalia*:** (Figs 6, 7) Uncus broadened subtriangular apically; gnathos thin, elongated, straight, gradually narrowed, extending to ¾ length of uncus. Transtilla arcuate, sclerotized, with paired rounded lobes in medial part. Lobe of valva simple, broad, with slightly curved costa, valva at base 1.5 times narrower than cucullus; juxta U-shaped, with slightly broadened lateral lobes with 5 short setae apically. Vinculum short, broadly rounded. Aedeagus nearly as long as 3/4 length of valva, cylindrical, moderately curved, oblique edged with a small apical protrusion on the dorsal edge. Vesica simple, elongate, rugose, and scattered with microspines in middle.

***Female genitalia*:** (Figs 9–10) Tergum VII elongate, subtrapezoidal; sternum VII with more sclerotized, broad, cup-shaped patch extending from posterior margin to about middle of sternum. Ovipositor moderately long, with papillae anales subtriangulate. Apophyses straight, posterior



Figures 6–10. Genitalia of *Apomyelois cognata* (Staudinger, 1871), Russia, South Ural, Donskoe. **6–8.** Male, genitalia preparation J. Šumpich 21077: **6.** General view; **7.** Aedeagus; **8.** Culcita; **9, 10.** Female, genitalia preparation J. Šumpich 21078: **9.** General view; **10.** Signum under high magnification.

apophyses nearly as long as anterior apophyses. Tergum VIII 1.5 times shorter than apophyses, evenly sclerotized except for broad, weakly sclerotized medial incision dorsally; ostium opening near anterior margin of sternum VIII, membranous. Antrum funnel-shaped, membranous. Ductus bursae broad and membranous; corpus bursae egg-shaped, about 2 times longer than ductus bursae, with single small round thorned plate in middle of corpus bursae. Ductus seminalis narrow, membranous, arising from anterior part of corpus bursae.

Biology. (Fig. 5) Host plant unknown. Adults were observed in the South Ural from early to late July at an elevation of 260 m and were collected on river terraces and psammophytic (sand-adapted) steppe habitats.

Distribution. European Russia (Volgograd and Orenburg regions), Cyprus (?), Iran.

Remarks. Examination of types and additional material of *A. cognata* shows clear morphological characters distinct from the closely related *A. bistriatella*, contrary to the information provided by Leraut (2014: 376) on the detailed similarity of *A. bistriatella* and *A. cognata*. *Apomyelois cognata* was originally described on the basis of five specimens from Sarepta, of which two males and a single female are now preserved in the MfN. Genitalia of the male and female syntypes were examined and labelled by U. Roesler as lectotype and allolectotype, respectively, and numbers 3310 and 3309 were assigned to their genitalia slides. However, these designations have not been established in Roesler's publications. For this reason, we have designated the above male syntype, genitalia slide number 3310, as lectotype; and the other two syntypes (female and male) as paralectotypes in order to stabilise nomenclature.

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